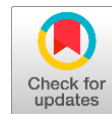


Animal welfare: Concepts beyond the borders of the university for children's schools



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Abstract Over the years, the production chain has become increasingly attentive to the changes and demands of the consumer public, requiring cultural adaptations and facing global challenges in terms of the welfare of production animals. In this context, the aim of this study was to assess the impact of including pedagogical practices on the subject of "animal welfare" in the learning process of elementary school children in public and private schools. In the process, the aim was to investigate how new perspectives on food production influence the critical thinking of students and, indirectly, the community through their parents. The research was carried out with 120 children in the fourth year of elementary school at two schools, E.E. Honorato Faustino (a public school) and Colégio Luiz de Queiroz (CLQ) (a private school), and their respective guardians. The project consisted of three main actions connecting the university, the school and the community: the construction of teaching material on good management practices for farm animals; the application of the material prepared in the volunteer schools; and the presentation of socioemotional questionnaires to assess the assimilation of the content. As secondary results, the animal protein consumption behavior of the children's guardians was also analyzed through questionnaires. After the dynamics, in both schools, the results identified significant discernment on the part of the children in relation to the subject, demonstrating the effectiveness of the training and the independent relationship between assimilation and type of education (public or private). The decision tree of public and private school students before and after AW training revealed that of the seven variables under study, only the variable "Do you know what the 5 degrees of freedom of AW are" separated the students according to training, regardless of the type of school. Through this research, it can be concluded that consumers still often do not consider the origin and method of production at the time of purchase, so work such as this reflects the importance and effectiveness of raising awareness among future consumers from an early age.

Keywords: sentience, children's learning, farm animals

1. Introduction

The welfare of farm animals is increasingly gaining the attention of consumers, who often see only the product and not the animals' condition as living beings throughout the production chain. In this context, the collective sense is increasingly in tune with animal sentience and its impact on the production process. Sentience, a word of Latin origin, "sentire", expresses the act of feeling or suffering and, in general terms, is the ability to be aware of oneself or one's surroundings (Singer, 2002).

In the 1960s, in the United Kingdom, with the publication of the book *Animal Machines* by Ruth Harrison and the public's shock at the writer's accounts of the mistreatment of animals in confinement, a less anthropocentric view of animal protein production began to emerge in British society. The book responsible for enlightening the public about the use of animals as production machines put pressure on the British government to investigate the matter and to set up an inquiry into breeding conditions. In 1965, the Brambell Report, which is responsible for conceptualizing the 5 freedoms of animal welfare (AW) (Cordeiro & Barbosa, 2021), was published. According to the Brambell Report, the welfare of farm animals can be measured through the following five freedoms:

- I) Freedom from hunger and thirst: animals must be guaranteed adequate food and fresh water to maintain their vigor and health;
- II) Freedom from discomfort: animals must be provided with shelter and rest (environments suitable for each species);
- III) Freedom from pain and injury: animals must be assured, by those responsible, of prevention, rapid diagnosis and appropriate treatment;
- IV) Freedom to express their natural behavior: animals must be guaranteed their instinctive behaviors, which require adequate space, facilities and company;



V) Freedom from fear and stress: animals must be protected from physical and psychological suffering and not subjected to conditions that cause fear or stress.

According to Broom and Johnson's (1993) definition, one of the most widely accepted in science, "an individual's well-being is its state in relation to its attempts to adapt to its environment". According to this definition, welfare represents the ease or difficulty with which production animals adapt to their environment and are comfortable.

Despite the quality of life of animals being another criterion in the conscious choice of food products, a significant portion of the population is unaware of how farm animals are raised or often receives information in a simplistic and emotionally charged way (Hötzel & Machado Filho, 2004). In addition, a large part of the consumer public for animal products is concentrated in urban regions and is often far from productive rural centers, resulting in ignorance of the vast majority of systems and management used in the intensive rearing of animals for consumption.

In this context, it is believed that education is a great ally in the dissemination of knowledge, making it effective from an early age as a way of awakening a critical sense in the formation of future consumers. As noted by Almeida et al., (2014), playful activities as pedagogical resources for children make learning more enjoyable, arouse interest and stimulate student participation in the classroom.

Given the above, the project "Animal Welfare: Concepts beyond the boundaries of the University - training the Piracicaba elementary school network", a proposal presented by the University of São Paulo (USP) with the support of the Dean of Culture and University Extension (PRCEU), was a pioneer in the state of São Paulo, involving the actions of the university with the local community, and its highlight was the understanding and dissemination of the five freedoms related to farm animals, demystifying and taking knowledge outside the university gates. The aim of this work was to disseminate, demystify and evaluate, through pedagogical practices, the perceptions of food of animal origin and the welfare of farm animals for children and young people.

2. Methodology

The execution of this work was subdivided into three main actions (Figure 1), which were carried out to expand knowledge, often restricted to the university, to the local community.

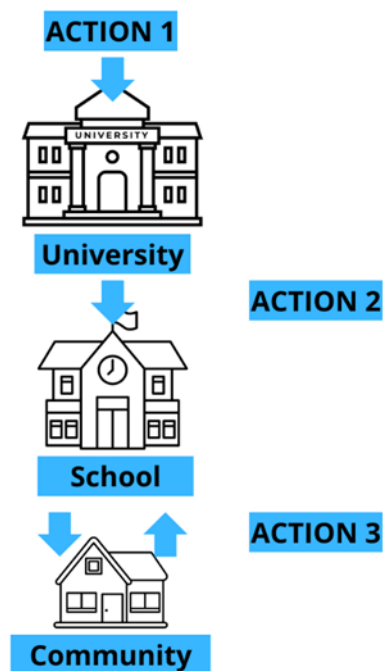


Figure 1 Flowchart of the project's implementation stages.

Action 1: Bibliographic study, technical review and development of teaching material on the basis of research in the literature on the welfare of farm animals.

Action 2: Visits coordinated by the technical team to partner schools to disseminate good practices in the process of producing animal products, using the teaching resources developed in action 1.

Action 3: Delivery and evaluation of socioemotional questionnaires to the participating children and their respective guardians at the beginning and end of the visits (action 2).

2.1. Action 1: Literature review and preparation of teaching materials

To develop the teaching material used in the classroom, we first searched the literature for the main concepts used in animal welfare studies. In view of this, as a technical basis, the concept of sentience and the principle of the 5 freedoms of AW (The Brambell Report, 1965) were chosen, which are the basic foundations for the conscious management of production animals and are easy to adapt to children's language.

Considering that illustration is a striking element in children's literature, Meira (2018) justifies its use for the purpose of expanding, questioning and justifying the text. In the meantime, after adapting the content for a child's audience, under the supervision of technical professionals in the field of animal production (NUPEA) and educators/pedagogues, the chosen narrative was inserted into a comic book, a tool commonly used in the process of child education (Modesto & Rubio, 2014).

2.2. Action 2: Monitoring activities at school

Actions 2 and 3 were approved by the Human Research Ethics Committee (CEP) of ESALQ-USP (number 5.988.936). For this project to be approved, the documentation necessary for submission to Plataforma Brasil was followed.

Before any contact was made with the children (and their guardians), the heads (principals and coordinators) were invited to receive the project at their respective schools. After meetings to understand the scope and benefits of the project, visits were scheduled.

This stage was conducted with students from the Honorato Faustino School and students from the Luiz de Queiroz College (CLQ), both in the municipality of Piracicaba, SP. The choice of schools was based on the research objective of analyzing the previous and acquired knowledge of public and private school students. The activities were aimed at students in the fourth year of elementary school (8–10 years old), who were divided into 63 children at the Honorato Faustino School (two classrooms) and 57 children at the CLQ (three classrooms) and their respective guardians (one per child), totaling 233 direct and indirect participants in the project.

Table 1 shows the organizational chart for the project in the schools, with three visits planned.

Table 1 Description of activities and respective visits.

Visit	Description of activities and respective visits.
1st	The children's guardians were given permission to take part in the project and the first questionnaire was sent to the adults.
2 st – 1st part	Collection of the documents sent and completed (1st visit), presentation of the project to the children, delivery and completion of the 1st children's questionnaire.
2 st – 2 st part	Collection of the 1st children's questionnaire, dynamics with reading and filling in the booklet, conversation circle and presentation of slides on AW Delivery, completion and collection of the 2nd children's questionnaire, and sending of the 2nd questionnaire to guardians.
3 st	Collection of the 2nd questionnaire for those responsible.

2.3. Action 3: Application of socioemotional questionnaires

Action 3 consisted of a quantitative evaluation of the children's educational process during the implementation of the project in the schools (action 2) and the possible effects on the behavior of their guardians.

Notably, the questions were adapted for both adults and children. Once the forms had been completed, the answers were analyzed, and the impact of the material presented on the children's knowledge was assessed, reflecting on whether there had been any changes in their perception of AW.

The children's questionnaire (Supplementary Materials A) consisted of 7 illustrative "yes" and "no" questions, where students answered according to their sensitivity and prior knowledge of animal welfare issues. The questionnaire for the adult audience (Supplementary Materials B) presented economic, social and positioning issues regarding animal production systems through 16 multiple-choice questions.

The same children's questionnaire was given to the children at the beginning and end of the activities carried out in action 2. The questionnaire for the guardians, which was sent with the authorizations to participate, generated secondary data to identify the socioeconomic profile of the participants. First, analysis of changes in behavior and gains in knowledge (indirectly through the children) was carried out via answers to the second questionnaire for the guardians, but the feedback was very low, making this impossible.

2.3.1. Statistical analysis

The data obtained from the responses to the animal welfare questionnaire were organized into contingency tables and analyzed using the Pearson's chi-square test (χ^2) to evaluate differences in response distributions before and after the intervention. To identify which categories showed statistically significant changes between time points, pairwise proportion comparisons with Bonferroni correction were performed, adopting a significance level of 5% ($\alpha = 0.05$). Additionally, a decision tree analysis was conducted to explore patterns and explanatory factors associated with changes in participant responses. This

method enabled the identification of relevant predictive variables and their split points, highlighting respondent profiles that were more susceptible to changes in perception regarding animal welfare after the educational intervention

3. Results

3.1. Action 1: Literature review and preparation of teaching materials

After the literature was reviewed and the content (5 Freedoms of AW and sentence) was adapted for a child's audience, the preparation of the teaching material used in the classroom began.

As mentioned in ACTION 1 of the methodology, the pedagogical tool chosen to talk to the children was a comic book narrative (Figure 2), developed by the technical team and supervised by pedagogues.





Figure 2 Pedagogical primer.

Translated version of the book:

Title: "João & Mariana in: Animal Welfare"

João: "Hi, Mariana!! What are you going to do this weekend?"

Mariana: "Hi, João! I don't know, what about you?"

João: "I'm going to visit my uncle José's farm with my parents and my siblings."

João (continued): "My mom is inviting you to come with us, shall we go? There are lots of animals, waterfalls, and tons of cool stuff there!"

Mariana: "Aaaaaah!! I love animals! I'll ask my parents!"

Narration: "The next day..."

Mariana (running excitedly): "JOÃO!! JOÃO!!"

Mariana (continued): "My parents loved the idea, and my mom already arranged everything with yours!"

Mariana (continued): "I'm going with you guys, for sure!"

João: "YAY!!! It's going to be so much fun!!"

João (continued): "You're going to see how my uncle raises his animals and how well he takes care of them. They're in full wellbeing!"

Mariana: "Wellbeing? What's that?"

João: "Oh, my uncle always talks about it. I think it's better if he explains it to you."

Mariana: "Deal!"

Narration: "At João's uncle's house, the kids spent the morning having fun and learning more about chickens, pigs, and cows."

Narration: At the table with the uncle João asked:

João: "Uncle, tell us how the animals are raised and what wellbeing means."

Mariana: "Yes! Please!"

João's uncle: "Of course, kids!"

João's uncle: "The food is produced on farms, where animals receive water, food, and all the necessary care to grow strong and happy. This is a way to ensure animal welfare."

João's uncle (continued): "Cows, for example, produce the milk we drink, just as chickens lay the eggs we eat."

Mariana: "Wow! I thought milk came straight out of the carton!"

João's uncle (continued): "But eating meat, milk and eggs is a choice for each person, not everyone consumes these foods. Some people can't or choose not to."

João's uncle (continued): "As I explained to you, milk, as well as meat and eggs, depends on a long production chain that starts on the farms!"

João's uncle (continued): "That's why it's important to know where the products we buy at the supermarket come from."

João's uncle: "For people who consume animal protein, it's important to understand that caring for the animals is essential for their welfare."

João: "That was my favorite part! Shall we talk about well-being, Uncle?"

João's uncle: "Let's do it!"

João's uncle (continued): "Welfare is a very important part of the production chain."

João's uncle: "Mariana, do you feel good when you're hungry?"

Mariana: "No, my stomach keeps grumbling."

João's uncle: "And you, João, do you feel good when it's too cold or too hot?"

João: "No, uncle! I like it when the weather is cool, not too rainy and not too hot — but it can't be cold!"

João's uncle: "Well, animals don't feel good either, because they're sentient beings."

Mariana: "Oh no! Another word I don't know! What does that mean?"

João's uncle: "All animals, just like us, are sentient beings. This means that they have feelings such as hunger, thirst, cold, heat, joy, fear..."

Mariana: "Even Rex, my dog, is a sentient being?"

João's uncle (laughing): "Ha ha! Of course, he is! This afternoon I'll explain everything to you."

João's uncle: "Now let's have lunch before the food gets cold! I'm starving!"

Narration: "Later, in the barn for dairy cows..."

João's uncle (talking to the kids): "Children, well-being means the good condition in which the animal lives — in other words, the animal has to be happy."

João's uncle (continued): "We can understand animal welfare through the five freedoms. Let's talk about each of them now!"

João's uncle: "The first freedom is to keep them free from hunger and thirst, by providing food and fresh water at proper intervals."

João's uncle (continued): "It's also important that animals are free from discomfort — this is the second freedom!"

João's uncle (continued): "We must keep them in pleasant temperatures, which vary from species to species. Oh! They must also have a comfortable and safe place to shelter and rest."

João's uncle: "The third freedom is to keep animals free from pain and diseases. For this, it's necessary to have a responsible professional always nearby to care for their health!"

Narration: "Now in poultry farm..."

João's uncle: "Did you know animals need to exercise? Animals also need to move, stretch, and jump so their muscles don't stay still."

João's uncle (continued): "That's why the fourth freedom states that it's very important for them to perform their natural behaviors. For example, chickens need to scratch, stretch their wings, and play with sand."

João's uncle: "Ah! And lastly, the fifth freedom: animals must be free from fear and stress. We must not scare animals, much less hit or mistreat them."

João: "Wow!!! They're really well taken care of. I wish I could live here!!! They have fans, beds, food, and everything they need to feel comfortable and happy."

Mariana: "Awesome! That's so cool!!! You really take great care of them, sir!"

João's uncle: "Thank you, Mariana! Animals are sensitive beings, and it's important to respect and protect their welfare."

Mariana: "Wow! I learned so many new things today! This 'welfare' stuff is really important!"

Narration: "The next day, João and Mariana say goodbye to their uncle and return to the city."

Mariana (excited): "Mom! Dad! Do you know what animal welfare is?"

Mariana (continued): "Next time we go to the supermarket, let's make sure the eggs, meat, and milk we buy come from farms that guarantee the animals' welfare — just like João's uncle's farm!"

The story illustrates the adventures of two children—João and Mariana—on the farm of a conscientious rural producer, who is responsible for explaining the 5 freedoms of AW and topics such as sentience and ambience, with revised language adapted to the age group, paying attention to the nonexclusive methodology (including groups that do not consume food of animal origin). The booklet also included educational activities, such as word searches, to fix the content.

The illustration, layout and cover of the booklet were developed by a partner designer, and the editing, cover layout, printing and finishing were the responsibility of ESALQ's Graphic Productions Service. The material was linked to the Rural Producer Series (No. 72), produced by the ESALQ Library Division, and is available as a free download (download link: https://www.esalq.usp.br/biblioteca/sites/default/files/publicacoes-a-venda/pdf/SPR72_0.pdf) and as a physical book (version made available to students taking part in the project). The booklet is also ISBN (International Standard Book Number - 978-65-87391-06-9) and ISSN (International Standard Serial Number - 1414-4530) registered.

In addition to the booklet developed, videos and images were presented together as support material for activities in schools, showing side-by-side images of animals with poor welfare and full welfare.

3.2. Action 2: Monitoring activities at school

The visits were scheduled after the schools invited to take part in the project had accepted and signed a declaration authorizing the use of the infrastructure, as recommended by the CEP.

3.2.1. Colégio Luiz de Queiroz (CLQ)

The first visit to the CLQ took place on April 27, 2023, when the principal received the documents to be sent and signed by those responsible (authorizations and the first questionnaire for adults) and told us a little about the school's tradition in the city.

The second visit, marked by contact with the children, took place on May 16. Notably, all the fourth graders, with the authorization of their respective guardians, were invited to take part in the research and activities; however, six children were not granted permission and were absent from the dynamics.

The meeting was attended by 17 children from fourth grade A, 20 children from fourth grade B and 20 children from fourth grade C, totaling 57 children interviewed. The school kindly gave each class 50 minutes (the duration of one lesson) to carry out the activities. It was also an opportune moment to collect the questionnaires sent to guardians at the first visit. In total, 53 adults responded to the survey (4 did not respond).

After the introduction of the technical team in the classroom, the children were given the first questionnaire to take into account the interviewees' prior knowledge. Once the questions had been answered, the documents were collected, and the booklets were distributed to the children so that they could take them home. Volunteer students and the technical team took part in the reading of the comic book, putting it into context with the prepared presentation and answering any questions that arose.

Finally, after the reading, the children were given the second questionnaire (along the same lines as the first questionnaire) to fill in with the knowledge they had acquired. The children were free to complete the fun activities in the booklet (word games). Once completed, the questionnaires were collected by the technical team, and the second questionnaire for parents/guardians was made available for sending out. Notably, all the dynamics with the children were accompanied by the teacher in charge and the school principal.

The third visit to the school, to collect the second questionnaire sent to the children's guardians, was not necessary, as the principal kindly sent the documents at an opportune moment.

3.2.2. E.E. Honorato Faustino

The first visit to E.E. Honorato Faustino took place on May 6, 2023, the same date as the parent-teacher meeting, in the presence of the children's guardians and the institution's teaching staff (teachers and coordinators). On that occasion, the booklet was presented, and the questionnaires and authorizations to be signed were sent out.

The dynamic with the children (second visit) took place on May 22nd. The school kindly provided 45 minutes (the duration of one lesson) with each class. The dynamics were attended by 30 pupils from room A and 33 pupils from room B, all of whom were duly authorized by their guardians, resulting in a total of 63 children taking part in the research. It was also good time to collect the questionnaires sent to parents and guardians during the first visit. In total, 60 adults responded to the survey (3 did not respond).

The activities with the children followed the same pattern as the script presented at the CLQ: introduction to the technical team, handing out and collecting the first questionnaire (prior knowledge), distributing and reading the booklet with the children (in addition to the material prepared and presented), and handing out and collecting the second questionnaire (subsequent knowledge). Notably, all the dynamics with the children were also monitored by the teachers in charge and the school coordinator. Once the activities were complete, the second questionnaire for the parents/guardians was made available for sending. Likewise, the children were free to carry out the educational activities in the booklet in the classroom or at home.

The third visit took place on June 2 with the school's management and was marked by feedback on the project and the collection of the second questionnaire sent to the children's guardians.

3.3. Action 3: Application of socioemotional questionnaires

3.3.1. Characterization of training

By collecting and analyzing the children's questionnaires (before and after), we arrived at the results shown in Table 2. The questions "Did you know that animals have feelings?", "Do you know what the 5 freedoms of animal welfare are?" and "Do you know what production animals are?" reported a lower frequency of "yes" answers before the training ($p=0.003$ and $p<0.001$). The other questions had a high frequency of "yes" answers before and after the training, with no significant differences.

By collecting and analyzing the guardians' questionnaires, the results shown in Table 3 were obtained. Those responsible for the children in the CLQ had a higher level of education and income than Honorato did ($p<0.001$). With respect to meat consumption and choosing products by brand, CLQ was more common ($p=0.001$), whereas Honorato was more likely to choose products by price ($p=0.001$). With respect to contact with farm animals, CLQ parents have this contact at least once a year more often ($p=0.18$). Furthermore, in relation to what welfare is and whether they believe that animals suffer during rearing, CL parents said "yes" more often ($p=0.202$ and $p=0.065$). The other questions had similar frequencies across the schools, with no significant differences.

The decision tree of public and private school students before and after AW training (Figure 3) revealed that of the seven variables under study, only the variable "Do you know what the 5 degrees of freedom of AW are" separated the students according to training, regardless of the type of school. In view of this, in relation to the previous question, nodes 1 and 2 reveal that 53 CLQ children before the start of the survey had no knowledge of the freedom (or more or less, as pointed out by the children themselves in the questionnaires), compared with 4 who said they knew. The postsurvey analysis revealed that 100% of the children absorbed the concept of the 5 freedoms of AW. In relation to the Honorato school and to the same question, 59 children did not know about the subject (or "more or less" as they themselves pointed out in the questionnaires), and 4 said they did. Finally, considering the answers after the dynamics, 59 children reported that they had absorbed the content, and 4 had not, demonstrating 96.7% efficiency of the project on the subject. Subsequently, nodes 3 and 4, resulting from node 1 (students who answered "no" or "more or less" to the question "Do you know what the 5 freedoms of animal welfare are?"), it was observed that CLQ students, before the training, had more knowledge about what farm animals are compared to Honorato students (34 CLQ children compared with 19 Honorato children).

4. Discussion

Products of animal origin that claim to be in line with EBA policies—through certifications and marketing strategies—are increasingly present on supermarket shelves. However, in regard to the relevance of the subject, consumers' critical choice is still very much based on the price and brand of the products, as indicated by the results of the survey with the guardians of the children interviewed.

When asked how they chose to buy animal products, only 10.6% of those responsible said they paid attention to the production system and 40.5% to their origin. In line with this, when asked about their knowledge of how farm animals are raised, only 9.7% of the respondents said that they knew them very well. In this scenario, as mentioned by Hötzel and Machado

Filho (2004), the ways in which animals are raised to provide food are unclear to a large part of society, and much of the information that reaches them is presented in a simplistic and emotionally charged way.

The answers to the questionnaires revealed that 88.75% of the responsible people interviewed were concerned with the quality of the products they consumed, which is a common factor of choice for both profiles analyzed. In addition, 94.8% of those interviewed believe that animals raised under welfare conditions will produce higher-quality products. In this way, initiatives that link animal welfare with product quality should be on society's agenda, making consumers critical and equipped with information for their decision-making power.

Activities such as those carried out in the classroom are extremely important for informing future decision-makers about the origin of animal products and how they are produced. According to Jerônimo et al., (2021), children should be made aware of and encouraged to respect animals from their earliest years. In this scenario, through the comments made by those responsible, left in the reserved space of the second questionnaire sent out, the same perception as the author can be seen. As mentioned by the ATFB (37 years old), one of the people interviewed in the survey:

• "It is extremely important to make society aware of issues related to animal welfare from an early age, and consequently about food."

Lobo (2021) also mentioned education as a way of spreading the science of welfare to children, raising their awareness and making them reflect on how they deal with animals. Almeida et al., (2014) point to playful activities as pedagogical tools for children's enjoyable learning, arousing interest and encouraging them to participate in classroom activities. In this scenario, the application of the comic book proved to be very effective in engaging children through reading and active student participation. In addition, the complementary presentation prepared by the technical team, featuring images and videos on animal sentience and the 5 freedoms of AW, generated discussions and raised questions on the subject in a light and relaxed way.

In view of the above, the children's positive response to the didactic material included two main questions ("Do you know what farm animals are?" and "Do you know what the 5 freedoms of animal welfare are?") were answered positively, with high rates of achievement, regardless of the school used, demonstrating that there is no difference in the assimilation of knowledge between public and private school children. However, the CLQ children had greater prior knowledge of what farm animals are compared to the Honorato Faustino schoolchildren. Thus, compared with Honorato, the CLQ children have adults in their families who are more involved with farm animals (50.9% of whom have contact at least once a year) and who are aware of how the animals are raised (61.5%), which may indicate a dialog and exchange of information between generations. Furthermore, the results of the previous answers can be linked to the students' curriculum, in which, according to the CLQ teachers, the origin of food had been worked on with the students.

As a challenge for the research, the low level of engagement of those responsible for answering the second questionnaire made it impossible to carry out comparative analyses (before and after) of the project, in which it would be possible to measure the impact of the children's learning on the adults.

The results of extensionist educational activities are effective in assimilating content. Therefore, to invest in the continuity of children's learning, conscious consumption actions should be increasingly present in the public and private school curriculum, making room for the formation of young people and adults with a critical sense and opinion formers.

Table 2 Frequency (%) of "yes" answers and comparisons between the answers given by the children at the CLQ (n=57) and Honorato (n=63) before and after the classroom dynamics were applied.

Questions	School/Treatment				p-value
	CLQ – After	CLQ - before	Honorato - After	Honorato - Before	
1) Do you like animals?	100 _a	100 _a	98.4 _a	100 _a	0.42
2) Do you think it is important to respect animals?	100 _a	100 _a	100 _a	100 _a	-
3) Did you know that animals have feelings?	91.2 _b	100 _a	81 _c	98.5 _b	0.003
4) Do you know what farm animals are?	61.4 _a	100 _b	38.1 _a	100 _b	<0.0001
5) Do you know where the milk and eggs sold in supermarkets come from?	100 _a	100 _a	88.9 _b	100 _a	0.002
6) Do you know where the meat sold in supermarkets comes from?	100 _a	100 _a	81 _b	96.8 _a	<0.0001
7) Do you know what the 5 freedoms of animal welfare are?	7 _b	100 _a	6.6 _b	93.7 _a	<0.0001

Table 3 Frequency (%) of "yes" answers and comparisons between the answers given by those responsible for the children at the CLQ (n=53) and Honorato (n=60) before the classroom dynamics were applied.

Questions		School		p-value
		CLQ	Honorato	
Educational Level	Elementary school	28.8 _a	13.6 _b	<0.0001
	Middle school	1.9 _a	1.7 _a	
	High school	1.9 _b	32.2 _a	
	Undergraduate	25 _b	37.3 _a	
	Graduate	42.3 _a	15.3 _b	
Household income:	< 1 minimum wage	0 _b	8.6 _a	<0.0001
	1 -3 minimum wage	2.1 _b	41.4 _a	
	3 -5 minimum wage	4.2 _b	22.4 _a	
	5 -7 minimum wage	4.2 _a	15.5 _a	
	7 -10 minimum wage	0 _b	8.6 _a	
	> 10 minimum wage	89.6 _a	3.4 _b	
1) Do you consume products of animal origin?		100 _a	100 _a	-
2) How many animal products are in your daily diet?	1	1.9 _a	3.3 _a	0.515
	2	3.8 _a	1.7 _a	
	3	7.5 _a	3.3 _a	
	4	1.9 _a	5 _a	
	5	30.2 _a	20 _a	
	6	54.7 _a	66.7 _a	
3) How often do you eat meat during the week (if you eat it)?	Once a week	0 _a	3.4 _a	0.001
	2-3 times/week	15.4 _b	43.1 _a	
	More than 4 times/week	26.9 _a	27.6 _a	
	Everyday	57.7 _a	25.9 _b	
Which points do you consider when buying and consuming animal products?	Branding	52.8 _a	23.3 _b	0.001
	Quality/appearance	92.5 _a	85 _a	0.215
	Pricing	32.1 _b	70 _a	0.001
	Origins	50.9 _a	30 _b	0.023
	Production system	9.4 _a	11.7 _a	0.701
	Ease of preparation	28.3 _a	26.7 _a	0.846
5) Do you know how animals are raised?		61.5 _a	57.6 _a	0.611
6) Regarding your knowledge of how farm animals are raised. you can say that:	Unknown	22.6 _a	20 _a	0.942
	Partially knows	67.9 _a	70 _a	
	You know it very well	9.4 _a	10 _a	
7) How much contact do you have with farm animals (cattle. poultry. pigs)?	Never had it	34.0 _a	40.7 _a	0.18
	Everyday	1.9 _a	6.8 _a	
	Once a week	0 _a	3.4 _a	
	Once a month	13.2 _a	16.9 _a	
	Once a year	50.9 _a	32.2 _b	
8) Do you care about the methods used to raise or slaughter animals?		55.8 _a	55 _a	0.935
9) Do you know what animal welfare is?		73.1 _a	58.3 _a	0.202
10) Do you think the animals suffer during confinement?		64.2 _a	43.1 _b	0.065
11) Do you think animals have any feelings?		95.2 _a	96.6 _a	0.546
12) Which of the feelings listed below do you think animals have?	Pain	86.8 _a	86.7 _a	0.984
	Happiness	67.9 _a	63.3 _a	0.608
	Fear	87.7 _a	86.7 _a	0.746
	Frustration	37.7 _a	21.7 _a	0.061
13) Do you believe that the welfare of farm animals is a matter of interest in our society?		79.2 _a	69.5 _a	0.371
14) Do you think that animals raised under welfare conditions will produce higher quality products?		98.1 _a	91.5 _a	0.293

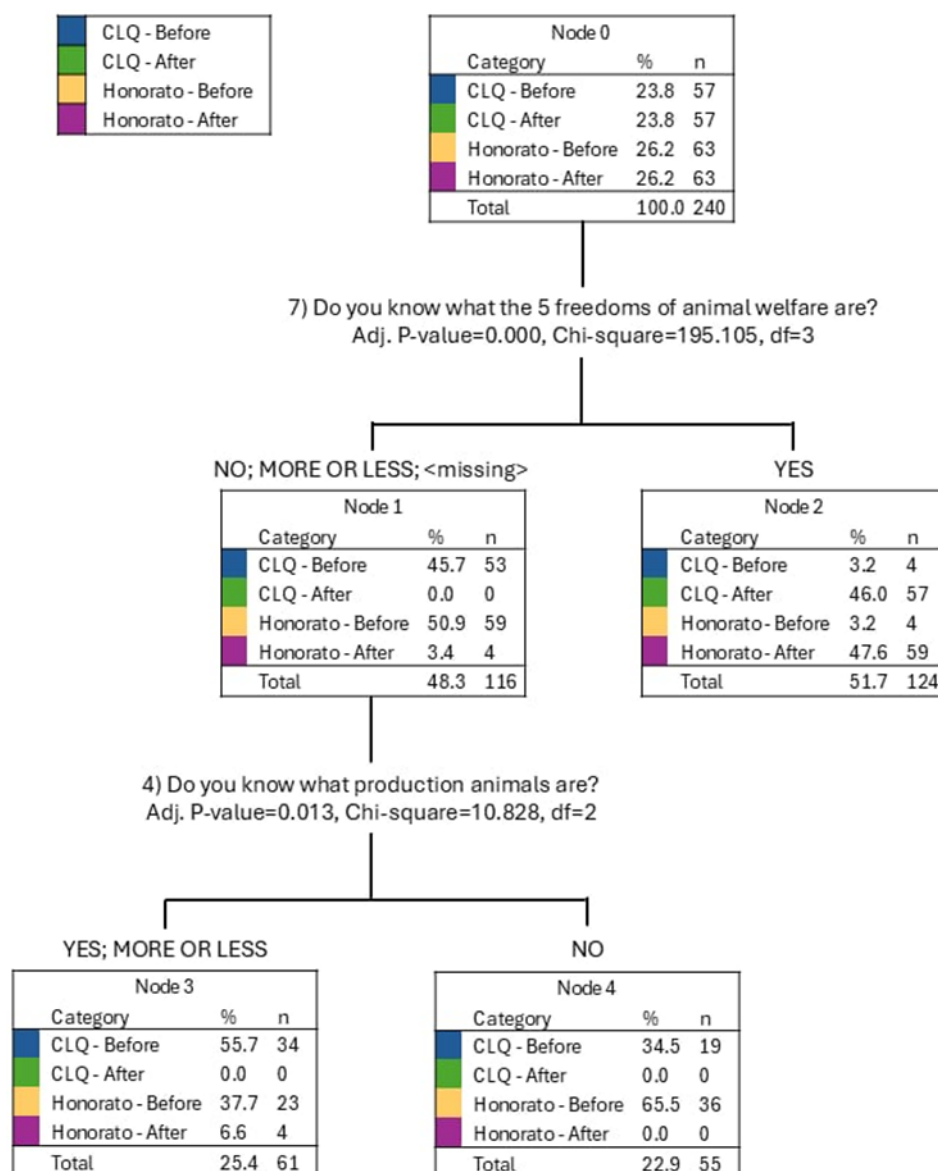


Figure 3 Decision tree for AW training with elementary school students from public and private schools in the municipality of Piracicaba - SP. *Source:* Personal archive (2023).

Based on the results obtained, it is possible to affirm that educational initiatives such as the one developed in this project not only promote understanding of animal welfare, but also align with global integrated approaches of One Health and One Welfare. As highlighted by García Pinillos et al., (2016), the One Welfare concept broadens the traditional One Health perspective by recognizing the interconnections between animal welfare, human well-being, and environmental sustainability. In this context, fostering critical awareness among children regarding the origin of animal-based products is an essential step toward building more ethical and healthier food systems, as emphasized by CABI One Health (2024). Furthermore, Jegatheesan et al., (2019) reinforce that interventions involving animals should generate mutual value and avoid any form of suffering—an ethical principle that guided the development of the pedagogical materials used in this study. Finally, it is evident that strengthening empathy and awareness among new generations contributes not only to the welfare of farm animals but also to the broader social and ecological network, as suggested by studies linking animal welfare to public health (Radeski et al., 2017).

5. Final Considerations

Notably, the project "Animal Welfare: Concepts beyond the boundaries of the University - training the Piracicaba elementary school network" was a pioneer in the state of São Paulo and developed a methodology and public teaching material that can be used in other initiatives, such as research and events, to strengthen awareness of this issue.

The results showed that before the training, the children at CLQ and Honorato had little knowledge of what farm animals are and, in both schools, little knowledge of the principles of the 5 freedoms of animal welfare. After the classroom dynamics

and the questionnaires, there was a complete understanding of what farm animals are and a significant grasp of what the 5 freedoms of animal welfare are by the children, demonstrating the effectiveness of the training and the material developed.

Few children's guardians are concerned with how the animals are raised, regardless of their income. Research shows that parents of children from private schools consider the brand and quality of products as factors in their choice, whereas parents of children from public schools consider price and quality.

Given the above, the project "Animal Welfare: Concepts beyond the boundaries of the University - training the Piracicaba elementary school network" opens up opportunities for new research on the subject and the dissemination of knowledge and awareness of the science of the welfare and sentience of farm animals in a clear and objective manner.

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Ethical Considerations

Notably, prior to contacting the children, their guardians were contacted via documentation, as requested by the CEP, who consented to their own participation and authorized the activities with their children, according to the Free and Informed Consent Form (TCLE) and the Declaration of Authorization for the Use of Files, Records and Similar. All children enrolled in the fourth year of elementary school at the volunteer schools and their respective guardians were invited to take part in the research, and there were no criteria for excluding or segregating students. However, only those children authorized by their guardians took part in the dynamics, whereas those who did not receive permission were assigned to other educational activities proposed by the schools.

Conflicts of Interest

The authors declare no conflict of interest.

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